SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

Engineering News-Record

AUGUST 27, 1932

Dneprostroy's First Spring Freshet

See Page 137

A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XXII *No. 594*

The Weekly Summary of Current Science

Published by

SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—$5.00 a year postpaid; two years, $7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give old as well as new address.

Advertising rates furnished on application.

Members of the American Association for the Advancement of Science have the privilege of subscribing to the SCIENCE NEWS LETTER at the reduced price of $3 per year. Application for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A. A. A. S., Smithsonian Institution Building, Washington, D. C.

Publication Office, 1930 Clifton Ave., Baltimore, Md. Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade mark, U. S. and Canadian Patent Offices.

? DO YOU KNOW THAT ?

Skeletons of apes and humans show greater likenesses in the young than in adults.

A sea-elephant can eat 150 pounds of fish in a day, and can go without eating for two months.

Of the 2,000,000,000 mammals in California, half are burrowing rodents such as ground squirrels and gophers.

Grouse eggs were found in a nest which was merely a hollow in the snow at 5,000 feet elevation at Mount Rainier, Washington.

The "modest" violet really hangs its head to keep the rain out, and to have the pollen fall in the flower most effectively.

Generally speaking, the rainiest time of day is in late afternoon and early evening, according to weather reports from various parts of the country.

The burial of a group of people, found in the hall of a house at Mohenjodaro, in India, indicates that human sacrifice was known in India 5,000 years ago.

In Arctic Greenland there is an ice-free area which has never been covered with glaciers.

With all the electric refrigerators, the ice man still sells 60,000,000 tons of ice in this country every year.

The six-year molars, the first of a child's permanent teeth, are pronounced by dentists the most important of the permanent set.

In ancient Rome, the Vestal Virgins were so highly honored that on the highways even a consul gave them the right of way.

At Minet-el-Beida, in Syria, archaeologists found the burial of a royal lady whose toilet articles included 1,000 vases for perfumes and other beautifiers.

Measurements taken at a Missouri experiment station showed that a one-inch rain swept off rich topsoil, planted to corn, at the rate of 19½ tons per acre.

Although Alaska's great piedmont glacier, the Malaspina, consists of ice over a thousand feet thick, a dense spruce forest can be supported by its dirt-mantled fringes.

WITH THE SCIENCES THIS WEEK

Curiosity arousing questions for the teacher and general reader. Book references in italic type are not sources of information of the articles, but are references for further reading. Books cited can be supplied by Librarian, Science Service, at publisher's price, prepaid in U. S.

ANTHROPOLOGY

What percentage of negroes in the United States are pureblooded? p. 129

ASTRONOMY

At what rate were meteors observed during the recent Perseid shower? p. 131

CHEMISTRY

How may gasoline be kept from losing its anti-knock value? p. 128

What new product is blacker than coal? p. 129

What percentage of coal can be converted into oil and other soluble products? p. 133

Why does doughnut-frying fat spoil? p. 132

ENGINEERING

How was the American plan for building the huge Soviet power plant, Dneprostroy, unlike that proposed by Europeans? p. 137

ENTOMOLOGY

What butterfly is thought to hibernate as a full-grown adult? p. 138

EUGENICS

Has birth control among the upper classes of France been beneficial? p. 127

How much do Harvard alumni fall short of replacing themselves in the world? p. 128

Why are Italian men becoming taller? p. 133

GENETICS

How may plant tumors give rise to new varieties? p. 133

PALEONTOLOGY

Where was a rhinoceros found which had been pickled in oil for thousands of years? p. 129

PHOTOGRAPHY-ENGINEERING

How can fast rotating machinery be made to appear to stand still? p. 127

PHYSICS

For what elements are new atomic weights predicted? p. 133

What is the first satisfactory explanation of the mechanism of radioactivity? p. 128

PSYCHOLOGY-POLITICS

How may childhood fears determine political affiliations? p. 130

PUBLIC HEALTH

How many cases of typhoid fever have been reported to the U. S. Public Health Service? p. 132

How many people live in the infected spotted fever area of the East? p. 138

SEISMOLOGY

Will reports of a major earthquake disaster in the interior of China soon reach the outside world? p. 132

EUGENICS

Birth Control Effects Negative, Dr. Osborn Tells Eugenists

Better Stocks Should Aim at Four-Children Families; Population Problems Not Solvable by Present Methods

BIRTH SELECTION, not birth control, is the great and pressing need of the human race today. The ablest and most intelligent people, who are today limiting their families to less than enough children to replace their numbers, are the very ones who should be encouraged and enabled to have at least four children per couple. Birth control should play only a subsidiary role in eugenics, for it is a negative rather than a positive factor. At present its social effects are distinctly bad, and even in the unlikely event that all classes were persuaded to practise it equally its effects could be no better than merely neutral.

This, in condensed summary, is the central theme of the "keynote" address of the Third International Congress of Eugenics, written by Dr. Henry Fairfield Osborn, president of the American Museum of Natural History, and honorary vice-president of the Congress.

Saw Need for Selection

As the truth of evolution was impressed upon Charles Darwin by things he saw during a voyage around the world, so the need for population control by the selection and encouragement of its fittest elements was impressed upon Dr. Osborn as a result of a world voyage which he recently completed.

Everywhere, he said, he saw evidences of overpopulation, overproduction and unemployment—harbors full of empty ships in the South Seas as well as in the ports of Europe, and men standing idle in the marketplace all the day long. As he analyzed the situation, it resolved itself into six "overs": over-destruction of natural resources, over-mechanization of industry, over-construction of means of transport, over-production of commodities, over-confidence in future demand and supply, and over-population, with the consequent permanent unemployment of the least fitted.

However, although he differed with some other scientists whose views he quoted, in regarding overpopulation as existing to a serious degree, even in the United States, Dr. Osborn refused to recognize birth control as a sovereign remedy.

"Birth control, primarily designed to prevent the overpopulation of the unfittest or dysgenic, may prove to be a two-edged sword eliminating alike the fittest and the unfittest," he said. . . . "I have in mind the French, among whom birth control has been practiced in the upper classes for centuries, with disastrous racial results. My doubts about the present propaganda and purpose of the birth control movement are that they are so largely negative and death-dealing rather than positive and birth-encouraging."

Dr. Osborn could not even admit the claims of birth control advocates to a humanitarian consideration for the sufferings of women in childbirth. On this subject he said, in part: "The attempt to relieve womankind of what may be termed the prehistoric and historic burden of the female of the species naturally enlists the sympathy both of the individualists of our time, who are ready to support any measure to give women greater freedom of profession and of action, as well as of the sentimentalists, who do not realize that women's share in the hard struggle for the existence of the race is a very essential element in the advance of womankind."

Science News Letter, August 27, 1932

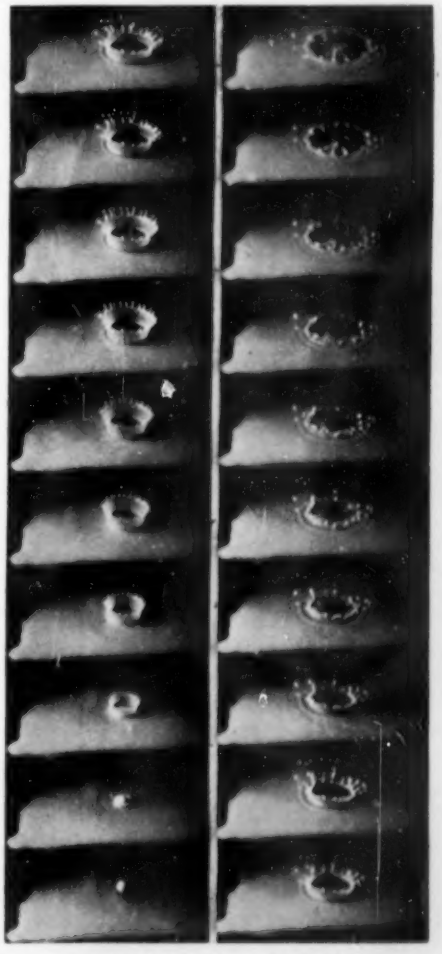
PHOTOGRAPHY-ENGINEERING

Stroboscopic Camera Takes One Picture Per Flash

THE RECENT development of very fast film for popular cameras has made unnesessary the usual admonition to "hold still" that amateur photographers gave their smiling subjects just before snapping the picture. But it is still essential for the photographer to keep his camera still, unless he is practicing stroboscopic photography.

The stroboscope, a rapidly fllickering light, has been used by engineers to examine moving chains, rotating machinery and other apparatus going through uniform motion too fast for the eye to follow. An electrically controlled light flashing 1775 times a minute makes a generator turning at 1800 revolutions per minute appear to be doing only 25 revolutions per minute. At exactly 1800 flashes per minute the machine is "standing still" for the observer, so effective is the optical illusion. Each light flash lasts for such a fractionally short time—only one hundred-thousandth of a second—and during that time the fast-turning machinery moves through so little distance that it appears to be stationary to the eye. It also appears stationary to the camera.

Thus the subject has been made "to pose" as many as 480 times a secound. The problem of getting a new film ready for each "sitting," which appears difficult at first thought, has solved itself. For flickering light which stills a generator turning at 1800 rotations per minute can easily catch a strip of film



480 PICTURES A SECOND

This is the rate at which the falling milk drop shown above was photographed with light from a stroboscope. Follow the views from lower left to top and then from lower right to top.

moving at a much slower linear velocity quickly enough to get the picture.

In apparatus developed at Massachusetts Institute of Technology, the film is pulled past an aperture, and each time the light flashes, a sharp exposure is made. The film is caught by the light for so short a time that it does not streak.

Stroboscopic photography is a boon to the engineer and scientist who can take valuable pictures in a small field illuminated only by the comparatively weak light of the stroboscope. Time will tell whether the new method can be improved successfully to invade portions of the motion picture field. Its simplicity and lack of shutter and mechanism to hold the film mechanically still for each exposure and each projection are assets.

Science News Letter, August 27, 1932

EUGENICS

Coeducational Alumni More Nearly Replace Themselves

Men Associating With Women At College Fall Short Of Reproducing Their Groups By Only 18 Per Cent.

GRADUATES of coeducational colleges have more children, and come nearer to replacing themselves as a population group, than do graduates of colleges for men alone or for women alone.

This conclusion has been reached by Caroline H. Robinson of Tunkhannock, Pa., after a statistical study of marriage and birth rates among 765 graduates of a coeducational college.

It is, of course, notorious that educated people do not have enough children to replace themselves. However, in this group, offspring of the men fell only 18 per cent. short of full replacement, as contrasted with a 32 per cent. deficiency among Harvard men. Among the women, the deficiency may be set at 41 per cent., a little worse than Bryn Mawr but far better than at the other women's colleges, where replacement is in some cases defaulted by as much as 55 per cent.

The men at this coeducational college married exactly as much as the general male population of the United States, while one-quarter of all Harvard graduates remain single, as against two-fifths for women's colleges.

Hard times has much to do with the small-family or no-family problem among college graduates, the speaker stated. After the panic of 1893, the spinster percentage at her coeducational college rose to two-fifths. And at all times, late marriage and small families seem to be the rule, especially for the men. Among all the men only two, both college professors, had more than five children.

Wealth was favorable to fertility in both men and women. Eighty-one men on the "special contributors" list of the college had more children than necessary to replace themselves, and 52 women on the same list had almost enough. The five women who had six children or more were all wealthy.

Science News Letter, August 27, 1932

PHYSICS

New Theory Explains Radioactive Disintegration

A NEW THEORY of why radium spontaneously explodes and disintegrates into other chemical elements was proposed by Prof. Werner Heisenberg, the young German originator of quantum mechanics and the principle of uncertainty, who lectured at the summer physics symposium of the University of Michigan.

Prof. Heisenberg visualizes the heart of the atom made up exclusively of protons, the positive particles, and neutrons, the newly discovered close combinations of proton and electron. Old ideas had the atomic nucleus built of protons and electrons, but Prof. Heisenberg holds there are no electrons or negative units in the atomic hearts except combined with protons to make neutrons.

He explains radioactivity by the fact that there are too many neutrons in relation to protons in the hearts of heavy elements. They are unstable. At intervals, this instability causes a neutron to burst and out rushes an electron which is discharged from the atom as a beta particle. The proton partner of the ousted electron remains in the nucleus. At other times the atom gets rid of mass by ejecting a bundle of two neutrons, or two protons combined with two electrons, which are equivalent to a helium heart, and smash outward in the form of an alpha particle.

This disintegration continues with radioactive elements changing into lighter ones until they reach a stable state as some lighter element. Radium in this way turns into lead.

This new Heisenberg theory provides the first satisfactory explanation of the mechanism of radioactivity. Under the Heisenberg theory the number of protons in each nucleus is equal to the atomic number, while the proton and neutrons together determine the atomic weight.

Prof. Heisenberg, who came to the United States from the University of Leipsic especially for the lectures at the University of Michigan, will publish the details of his theory in the *Zeitschrift für Physik*.

Science News Letter, August 27, 1932

CHEMISTRY

Anti-Oxidizing Substance Found for Anti-Knock Gas

PARA-BENZYLAMINOPHENOL. That's what you're going to get in your anti-knock gas. It will keep the anti-knock properties in, and it will keep gumminess out.

At the recent meeting of the American Chemical Society, two Chicago petroleum chemists, Dr. T. H. Rogers and Dr. Vanderveer Voorhees, told of their search for something that would make cracked gasoline keep better and yet leave its anti-knock properties as nearly intact as possible.

Cracked gasoline has a tendency to combine with oxygen from the air, building up gummy substances that "varnish" the insides of feed lines, and otherwise make trouble. Gas that has thus gone gummy also loses much of its anti-knock value. Various treatments, notably one using sulfuric acid, prevent the gumminess, but also kill the anti-knock.

Drs. Rogers and Voorhees have tried a large number of oxidation-preventing substances, and their choice as the most efficient, both for stopping gumminess and for not harming anti-knock, is para-benzylaminophenol.

Science News Letter, August 27, 1932

CHEMISTRY

Silica Black Is New Product Of Many Possible Uses

BLACK COAL and white earth mix to produce something blacker than the original coal. It is called "silica black" by its discoverer, Prof. C. A. Jacobson of the University of West Virginia, and it is expected to find many industrial uses, all the way from paint pigment to an absorbing agent for soaking up fumes and moisture. Prof. Jacobson described his product at the meeting of the American Chemical Society in Denver.

Silica black is made by reducing coal to an extremely fine powder and mixing it intimately with some form of silica which has also been reduced to pulverized form. In most of his experiments Prof. Jacobson used diatomaceous earth.

The mixture is heated in a closed vessel from which air is excluded, the temperature being raised to 600 degrees Fahrenheit or above. Considerable gas and some other products are driven off. The solid silica black that is left is a powder as fine as the original ingredients, and much blacker than the original coal.

Silica black, Prof. Jacobson said, appears not to be a simple chemical compound nor even a uniform mixture. It seems to consist in part of carbon and silica clinging very tightly to each other, in the physical bond known as "adsorption," rather than as a true chemical union.

But whatever its chemical nature may be, silica black has possible industrial properties that Prof. Jacobson has found it very interesting to investigate.

The most promising use seems to be as a paint pigment. The blackness of the black is highly permanent, and the fineness of the particles make for good dispersion through the paint medium. It has a high attraction for oil, which again is an advantage in some kinds of paint use. It is also highly resistant to acids and other chemicals, which suggests a usefulness for laboratory table tops and other furniture subject to the severest kind of abuse.

Other suggested uses are as an ingredient in shoe polish, insecticide, leather tint, wood grainer, drying agent, and fume absorbent.

Science News Letter, August 27, 1932

ANTHROPOLOGY

Negroes Grow Lighter, But Color Will Never Be Uniform

NEGROES in America are becoming lighter in color, as a race, but a considerable range in duskiness of skin will always be found among them. These are among the results of a study of assortative mating for color among Negroes made by Dr. Irene Barnes Taeuber of Mt. Holyoke College and presented before the Third International Congress of Eugenics.

Little new white blood is now entering the Negro racial mixture in America, Dr. Taeuber stated. Nevertheless the race as a whole is growing lighter, due to crossings with the lighter-colored stock already in existence. The unmixed Negroes are a dwindling group: their percentage among parents at present is 29, as against only 14 per cent. of pure-blooded Negroes among the offspring.

"The American Negro population of the future will probably be more homogeneous as to ancestry," said Dr. Taeuber; "There will be a smaller percentage of unmixed Negroes, a larger percentage with half or more Negro ancestry, and a smaller percentage who pass as Negroes but have more white than Negro ancestry. The segregation process operative in the inheritance of pigmentation will prevent the development of a population of one uniform hue."

Science News Letter, August 27, 1932

PALEONTOLOGY

Ice Age Rhinoceros Displayed in Museum

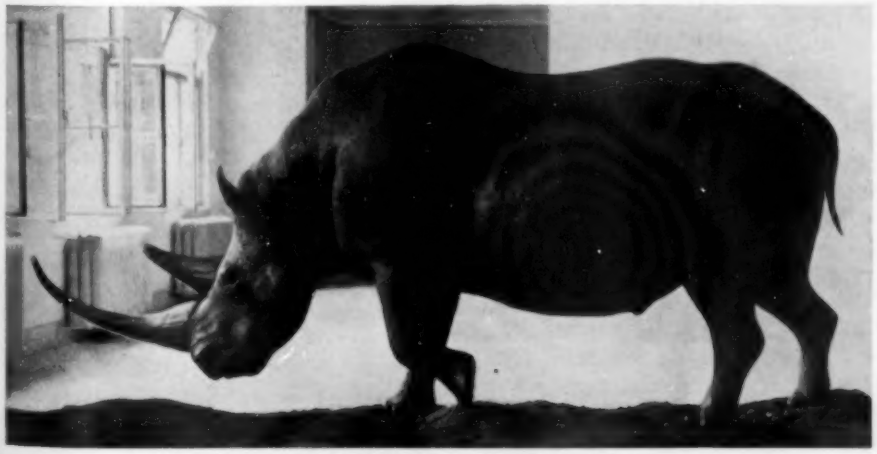
THE MOUNTED skin of a woolly rhinoceros, that ranged the swamps and plains of Poland during the Ice Age, has been placed on display in the Museum of Physiography of the Polish Academy of Sciences at Cracow. It is complete and lifelike, in spite of its hundred thousand years or more of antiquity. The only defect is the absence of the thick wool and long hair with which it was once clothed, so that it now resembles in its nakedness the modern rhinoceroses of Africa and Asia.

The animal was discovered buried in a silty deposit in the region of Starunia about three years ago. With the exception of its internal organs, it had been preserved through the centuries by the crude oil and salt with which the silt was impregnated. After a great deal of difficulty, the ponderous carcass was removed from the earth through a special shaft and transported to Cracow for skinning, dissection and study. A plaster model was constructed over which to stretch the skin.

The bones, which were pretty badly shattered, were reassembled and mounted separately. Regrettably, the skull was especially badly broken in the rough tumbling the animal had received after its death, presumably by drowning in a swollen-post-glacial river.

Associated with the carcass were many plant remains, indicating the existence of a tundra-like vegetation, dominated by dwarf birches and willows, during the lifetime of the rhinoceros.

Science News Letter, August 27, 1932



PICKLED IN OIL SINCE THE ICE AGE

PSYCHOLOGY-POLITICS

Science Studies the Politician

Political Personalities Divide Into Three Main Types: Administrator, Agitator, Theorist

By MARJORIE VAN DE WATER

WHAT MAKES the politician what he is? From the President himself down to the soap-box orator on the street corner, ardent wet and zealous dry, anarchist and bureaucrat, Senator and ward boss—what was the obscure turning point which brought them to their present paths?

It occurred to Prof. Harold D. Lasswell, who teaches political science at the University of Chicago, that the answer might be found in a thorough study of the previous lives of these men—a study as searching as that made by the psychiatrist. If the physician by delving into the obscurities of the youth of his patient can find out what brought him to the insane hospital, why shouldn't a similar search into the history of the normal man reveal what brought him into Congress or the White House?

Accordingly Prof. Lasswell undertook to make such studies following the methods of Freud. In this he had the assistance of many prominent psychiatrists who approved his methods, although some conventional psychologists may disagree with them.

A few such detailed histories were ready-made at hand, because some politicians had at one time or another been patients in mental hospitals. In other cases, the politicians volunteered to make their private histories available for the purpose because they realized that our knowledge of human nature in politics would be advanced if normal persons were studied with the same care as that bestowed on the abnormal.

Only living persons were included—individuals who were studied personally by specialists under conditions of unusual intimacy. There was no hauling out of anecdotes of the youth of historic personages. No attempt to make interpretations from second-hand documents regarding remote persons with whom there could be no personal touch.

Nor was it Prof. Lasswell's purpose to prove that politicians are insane or to catalog the symptoms of such prominent men.

"We have not finished when we know that modern Alexanders, Caesars, and Blüchers are alcoholic; that a modern Bismarck is hysterical; that a modern Lincoln shows depressive pathology; or that a modern Marat suffers from arthritis, diabetes, and eczema," Prof. Lasswell says in his report which has been published by the University of Chicago in a book entitled "Psychopathology and Politics."

Rather his purpose was to examine the whole of the private lives of these individuals and discover what experiences were significant in developing the traits and interests of the politician—what were the psychological turning points of his life.

Hoover Called Administrator

Politicians, he found, may be divided on the basis of personality into three main types—the administrator, the agitator, and the theorist. President Hoover, he cites as an example of the first type, the administrator pure and simple. The Old Testament prophets were good examples of the agitator. And the theorist is best typified in Karl Marx.

There are, of course, many composites of two or more of these types. Lenin, the hero of Soviet Russia, for example, is described by Prof. Lasswell as a combination of all three types, administrator, agitator, and theorist.

From his study of these three types and the various composites, Prof. Lasswell has even worked out a very definite and mathematical-looking formula to express the personality of the politician. Here it is:

$$p \} d \} r = P$$

where p, he says, represents private motives; d represents displacement onto a public object; r represents rationalization in terms of public interest; P represents the political man; and } represents "transformed into."

Suppose we translate all this into more understandable language by fitting the formula to a special case.

Johnny Jones as a small boy owned and was very fond of a pet dog. The dog died as a result of the cruelty of some neighborhood urchins who pegged stones at the luckless puppy. Johnny developed a profound love for dogs and also perhaps a parallel hatred for gangs. This love and this hate comprised his "private motives."

As he grows up, if he were to be an ordinary citizen, he might start a farm to raise dogs.

But Johnny is to be a politician of the agitator type. So instead of surrounding himself with real live dogs, his interest is displaced onto dogs in general. He founds a society for the prevention of cruelty to dogs. He interests himself in legislation forbidding the keeping of dogs in the city or forbidding the dissection of dogs even for scientific purposes, and so on.

The next step is to rationalize his attitude in terms of public interest. He builds up arguments showing that dogs are essential to the public welfare. He writes pamphlets describing the good that dogs do in protecting human life, in leading the blind, in returning affection for kindness.

The big difference between Johnny and his non-political brother is then that the object of Johnny's emotional interest has been entirely changed. It is no longer the bark and nuzzling nose and the pathetic wag of a stubby tail that appeal to him; it is the idea of dog in the abstract that he is crusading for.

Agitators Were "Spoiled" Children

Among the agitators studied by Prof. Lasswell, one trait seemed to be so very common as to be characteristic. This is what psychologists term narcissism, an excellently descriptive word derived from the name of the Greek youth Narcissus, who gazed into a placid pool one day and fell in love with the beautiful image of himself he saw there reflected. Agitators, Prof. Lasswell tells us, have their affections equally centered on themselves. And this is often because as children they were "spoiled" by their parents or made the center of an admiring family group.

The agitator, he says, may also have been hindered by some obstacle from developing a normal love affair. All the affection that the ordinary man showers on the one and only girl is dammed up in the agitator and finally finds expression in his emotional excitement over a cause. And the ordinary person's desire to impress and be loved

by a definite individual becomes in the agitator a more generalized desire to impress and arouse the crowd, the community, great masses of people.

In the family history of agitators "there is often a record of a 'model boy' during the early years, or of a shy and sensitive child who swallowed his resentments," Prof. Lasswell found. Resentments, too, as well as affections pop up in later life in much more generalized form.

Many administrators — those with drive, imagination, and the fire of enthusiasm greatly resemble the agitators in personality and developmental history, Prof. Lasswell found. The chief difference that sets them apart from the agitators is that their emotions are centered on less remote and abstract objects. In fact they are quite likely to become emotionally preoccupied in early youth with specific individuals in the family circle or immediate acquaintance so that their whole future conduct is dependent upon these early relations.

Conduct Depends On Early Relations

One of the administrators described by Prof. Lasswell, but disguised under the substitute for a name, "Mr. H.," (which is not, however, his initial) developed in childhood an intense hatred of a stern and domineering father. This hatred had throughout his life been hidden and he had gotten along in the home through deceit, posing as a model child except for a few incidents when his transgressions came out. He was caught in a childhood misbehavior with a little girl of the neighborhood and thereafter had many fights with the girl's brother. Many years later when he was opposed to this boy in a debate he was so emotionally disturbed that he actually fainted. In business, his suppressed guilty feelings and hatred showed up plainly in his dealings with both superiors and his men. His engaging manners won him favor with those above him, but his feeling of insecurity led to an unreasonableness and an arrogant pose which antagonized every man who worked for him.

Not all administrators are of this type, however. Some may exemplify the happy medium between the person with his head in the cloud of abstractions and that other who is so tied down to definite situations and individuals that his sense of values is completely disturbed.

"We may suggest that another group of administrators is recruited from among those who have passed smoothly through their developmental crises. They have not over-repressed powerful hostilities, but either sublimated these drives, or expressed them boldly in the intimate circles," Prof. Lasswell says.

"They display an impersonal interest in the task of organization itself, and assert themselves with firmness, though not with overemphasis, in professional and in intimate life. Their lack of interest in abstractions is due to the fact that they have never needed them as a means of dealing with their emotional problems. They can take or leave general ideas without using them to arouse widespread affective responses from the public. Tied neither to abstractions nor to particular people, they are able to deal with both in a context of human relations, impersonally conceived."

Well-Adjusted Type Is Rare

You may judge for yourself how rare is this well-adjusted type of executive in business as well as in politics.

You might think that the political theorist, the developer of political creeds, like Marx, would not be of interest from the point of view of Prof. Lasswell's study. But he has found that the individual's history counts here, too.

"Political prejudices, preferences, and creeds are often formulated in highly rational form, but they are grown in highly irrational ways," he says.

"When they are seen against the developmental history of the person, they take on meanings which are quite different from the phrases in which they are put."

Thus "Mr. P." because of emotional disturbances in his youth and other reasons failed to get along with his studies and seemed likely to prove a great disappointment to his ambitious father. The war came along just in time to save face for the boy. He joined the army and made a fine record for personal courage. Once the war was over, his troubles began again and all his old worries returned. In the light of this record, the fact that "P." is strongly militaristic in his views becomes very understandable.

"G.," however, is a socialist and pacifist. And a look into his early history shows that from a very early age, he has had what is known as a "blood phobia." His morbid fear of the sight of blood later extended to many other objects; he was afraid of dogs and cats and horses because they might scratch or bite him, and carefully avoided fights with the other boys. Later on, when he heard that western capitalism meant war and bloodshed, he experienced a profound revulsion against "capitalism," "imperialism," and everything that in his mind went with them.

Science News Letter, August 27, 1932

ASTRONOMY

Thousands of Meteors Seen During Recent Shower

MORE THAN 28,000 meteoric flashes in the night sky were seen from more than 150 localities by several hundred observers who watched for the Perseid meteors early this month (August 10 to 12), it is indicated by reports received by Prof. C. P. Olivier of the Flower Observatory of the University of Pennsylvania up to August 17. Prof. Olivier is president of the American Meteor Society.

More persons saw more meteors this year than at any previous return of the shower of the famous Perseid "shooting stars," said Prof. Olivier, praising the newspaper cooperation that inspired many laymen to make meteor counts and report them. Prof. Olivier expects that later reports from the western coast and foreign countries will increase the record.

Meteors falling at the rate of 208 an hour was the record observation of a group of Columbia College students at Dubuque, Iowa, who watched the recent shower. Even on August 7, which was six days before the peak of the shower, a group of six saw 140 meteors an hour while an individual observer recorded 80 an hour. The highest rate of 208 an hour was a group observation at 1 a. m. on August 12, when the rate seen by one person was 116 per hour.

The observations were organized by Prof. John Theobald.

Science News Letter, August 27, 1932

PUBLIC HEALTH

Typhoid Fever Increase Due To Low Sanitary Funds

TYPHOID fever is increasing all over the nation. More typhoid fever cases have been reported to the U. S. Public Health Service in the last four weeks than were reported at corresponding times in the last four years. Health officials think it may be due to certain laxity in sanitary procedures as a result of decreased state and municipal appropriations for such purposes.

For the week ending August 13, there were 1,243 cases reported. For the week ending August 6, there were 1,119 cases, while during the corresponding period last year there were only 996. July 30 of this year there were 1,091 cases, and 908 in 1931. July 23 there were 1,294 cases, as against 751 the preceding year. Health officials think the peak may have been reached on August 13, although the case reports are expected to run rather high between now and September 15. The peak of the usual seasonal increase in the disease occurs between the middle of August and the middle of September. Either the peak has been reached earlier than usual this year or the number of cases will go still higher.

Typhoid fever is now one of the preventable diseases. It was originally brought under control by sanitary measures, such as proper sewage disposal, purification of water supplies, pasteurization of milk, and supervision, as far as possible, of typhoid carriers. One attack of typhoid fever makes a person immune to subsequent infection, and this immunity may now be given by a course of inoculations with killed typhoid germs. The United States Public Health Service, however, warns that this individual immunization cannot take the place of organized sanitary control and prevention.

Science News Letter, August 27, 1932

ASTRONOMY

Eclipse Shadow Bands Successfully Photographed

SHADOW BANDS were photographed in at least two instances during the total solar eclipse of Jan. 24, 1925. This note corrects a statement that they have never been photographed (*SNL, July* 30, '32, *XX, p.* 72). Prof. W. L. Eikenberry of State Teachers College, Trenton, N. J., calls attention to his report (*Science,* LXI, p. 566, May 29, 1925) of a photograph made by Glenn Lowry, Stroudsburgh, Pa., photographer. Prof. Harlan T. Stetson, in *Scientific Monthly,* XXI, p. 664, Dec., 1925, describes shadow band photographs made by a Harvard College Observatory expedition. Prof. W. H. Pickering of Harvard nearly fifty years ago produced artificial shadow bands using a search light. An Italian expedition photographed the bands of another eclipse.

On the map of eclipse path (*SNL, July* 30, '32, *p.* 69) read 1 min. 38 sec. instead of 1 min. 30 sec. for the period of totality at 3.30 P. M.

Science News Letter, August 27, 1932

CHEMISTRY

Spoilage of Frying Fat Due to Water in Food

WHEN the baker finds that the fat in which he has been frying his doughnuts begins to give an objectionable taste to the food, it is not alone because of the high temperature at which he has been keeping the fat. He must also blame the water present in the doughnuts.

This conclusion was reached by F. R. Porter, H. Michaelis, and F. G. Shay, of the Edison General Electric Appliance Co., who have studied this cause of loss to the baker.

When the equipment used by bakers and chefs was smaller, this breaking down of fat, which necessitates throwing it away, was not so important because in the usual gas-heated fry kettle only about 10 to 15 kilograms or about five dollars' worth was discarded weekly. Now, however, modern equipment holds 130 to 180 kilograms and the waste is consequently considerable.

The chemists who studied the problem made experiments both in the laboratory and in a bakery under actual bakery conditions. They found that high temperature alone would not produce much breakdown of the fat. The breaking down involved the formation of acid and was the direct result of a reaction with water while hot. Besides the acid, glycerol is formed, and this in turn changes into water and acrolein, which burns the eyes and is most unpleasant to smell and taste.

The amount of acid present in the fat is a good index to whether it will give the objectionable taste to the food; the disagreeable flavor appears at about 4.4 per cent. acid.

Science News Letter, August 27, 1932

IN SCIEN

SEISMOLOGY

Quake In Interior China May Prove Major Disaster

THOUSANDS of lives may have been lost in an earthquake which occurred at about noon on Sunday, August 14, (Chinese time) in the interior of China; although news of the disaster may be delayed weeks and months in being reported to the outside world.

An earthquake shock of at least moderate severity was registered on seismographs throughout the world at 11:39 1/2 p. m., Eastern Standard Time, Saturday night. Through data wired to Science Service and interpreted by the U. S. Coast and Geodetic Survey, it was found that the center of the disturbance was located in the Yunnan province of the Chinese interior at approximately 27 degrees north latitude and 103 degrees east longitude.

This is an earthquake region and there are many inhabitants. It is a part of China known for its sliding mountains and it is probable that many lives were lost.

It is south of the Kansu region of China, in which destructive earthquakes occurred in 1920 and 1927. The 1920 quake caused 500,000 deaths. The 1927 quake was flashed to the world as a probable major disaster by Science Service's earthquake reporting service two months before the news from the locality reached telegraph lines.

Science News Letter, August 27, 1932

RADIO-ASTRONOMY

Radio Compasses to Detect Eclipse Effect on Broadcasts

RADIO compass observations to determine changes in the direction of radio broadcasting signals before, during and after the total eclipse of the sun, August 31, will be made by Dr. Ernest Merritt, head of the department of physics at Cornell University. His expedition will be located at Whitefield, N. H., and several radio compasses will be trained on broadcasting stations within and without the path of the moon's shadow.

Science News Letter, August 27, 1932

...E FIELDS

METEOROLOGY-ASTRONOMY

Weather During Eclipse Recorded At Many Points

EXTENSIVE observations of the weather during the total solar eclipse of August 31 are planned by Dr. Charles F. Brooks, director of the Blue Hill Observatory of Harvard University. About twelve stations within the path of the shadow will be occupied, including one on the summit of Mt. Washington, 6,288 feet high.

Sensitive barographs to measure pressure of the atmosphere, thermographs to measure temperature, hygrographs to measure humidity, and anemographs to measure wind velocities and directions will be in automatic operation during eclipse and for several hours before and after eclipse.

A total solar eclipse has been described as a kind of laboratory experiment in which are eliminated practically all influences upon the atmosphere except that of a fall in temperature.

Science News Letter, August 27, 1932

PHYSICS

New Isotopes Predicted With Neutrons as "Bricks"

COBALT of atomic weight 57, manganese of atomic weight 53, and vanadium of atomic weight 49 are predicted by Dr. James H. Bartlett, Jr., young American physicist and fellow of the National Research Council, through the use of a new theory of atomic structure in which neutrons and protons only are used as building blocks of the nucleus.

The normal atomic weights of cobalt, manganese and vanadium of the sorts now known are 59, 55, and 51 respectively. Atoms of different weight but having identical chemical behavior are known as isotopes.

Dr. Bartlett, whose home is in Quincy, Mass., announced his research in a letter to *Nature*.

The neutron was identified as an entity only a few months ago. It is a close combination of an electron and a proton. Older theories of atomic structure considered the hearts of atoms as built of protons and free electrons but the discovery of the neutron has led to the theory that electrons occur within the nucleus only as parts of neutrons. Starting with a helium nucleus and adding alternately a neutron and a proton, Dr. Barlett obtains all the elements in the chemical table up to oxygen of atomic weight 16, namely, lithium 6 and 7, beryllium 8 and 9, boron 10 and 11, carbon 12 and 13, and nitrogen 14 and 15. Beyond oxygen, owing to a change in the arrangement of the "bricks" within the inner shell (two neutrons being more stable in the central field than a neutron and a proton) the order of addition becomes: neutron, neutron, proton, proton, and repeat. This gives oxygen 17 and 18, fluorine 19, neon 20, 21 and 22, sodium 23, magnesium 24, 25, 26, etc.

Science News Letter, August 27, 1932

GENETICS

New Tomato Variety Started From Tumor

POSSIBILITIES of new varieties of plants being originated from tumorous growths purposely induced are held out by results of an experiment reported in *Science* by Dr. Dontcho Kostoff of the Leningrad Academy of Sciences and Dr. James Kendall of New York City College.

Experimenters had noticed abnormalities in the internal structures of cells in plant tumors caused by the microorganism *Bacterium tumefaciens*. They were of a kind that often goes with the production of new varieties.

Drs. Kostoff and Kendall therefore deliberately set about producing tumorous tomato plants by injecting the bacteria into the stems. When the tumors developed, they cut the stems off just above them, to induce the formation of new sprouts. Some of these sprouts arose from the tumors, and part of them displayed the cellular abnormalities they sought for. By cutting off these tumor-formed sprouts and rooting them in soil, they were able to obtain independently-growing plants entirely of tumorous origin.

The new plants do not differ greatly from the parent stock. They resemble it closely in stems and leaves, but the flowers are a little larger. However, the experiment is regarded as significant because it points the way toward a new method of inducing the development of new plant varieties.

Science News Letter, August 27, 1932

CHEMISTRY

Nearly All of Coal Changed Into Oils and Solubles

TWO University of Washington chemists, Prof. W. L. Beuschlein and Dr. C. C. Wright, do not fear a shortage of gasoline and oil when the world supply of petroleum is exhausted, for they have found that as much as 80 to 90 per cent. of coal can be converted into oil and other soluble products.

In Germany, where coal is more plentiful than petroleum, gasoline is already made from the solid fuel by the hydrogenation process. The present low cost of petroleum in this country makes the application of such a process here seem remote.

Prof. Beuschlein and Dr. Wright used different coals from Alabama, West Virginia, Kentucky, Illinois, Pennsylvania, Utah and Washington. The best coals gave the highest yields of oil, but even with the inferior lignites, or brown coals, about one-third of the coal was converted into soluble products.

Their work, which was made possible by a grant of the National Research Council, is chiefly of value now in the classification of coals.

Science News Letter, August 27, 1932

EUGENICS

Italian Melting-Pot Works; Men Are Becoming Taller

SIGNOR MUSSOLINI may never be able to review whole brigades of six-foot grenadiers, such as used to delight the military eye of the father of Frederick the Great; nevertheless the troops who salute him today are taller than those who fought for Italian liberation in the seventies. The increasing height of Italian men during the past half-century was one of the points brought out in a statistical study presented at the meeting of the Third International Congress of Eugenics in New York, by Prof. Marcello Boldrini of the Catholic University of Milan. Italians are not only becoming taller, but the height of the male population is becoming more uniform.

Prof. Boldrini ascribed this result partly to the complete blending of the three diverse racial stocks that constituted the original population of Italy, partly to better economic conditions in the country during the recent past.

Science News Letter, August 27, 1932

ASTRONOMY

The Eclipse of 1878

"A Classic of Science"

Fifty-Four Years Ago Langley Observed From Pike's Peak
The Eclipse Which Will Recur in New England August 31

ASTRONOMICAL AND METEOROLOGICAL OBSERVATIONS Made During the Year 1876, *at the United States Naval Observatory. Appendix III. Reports on the Total Solar Eclipses of July* 29, 1878 *and January* 11, 1880. *Issued by the United States Naval Observatory. Washington,* 1880.

Report of Prof. S. P. Langley

AS ORIGINAL records of an observation are trustworthy in proportion as they have been presented in their first crude state, I endeavor to give the impressions as they rose in my mind, and will comment on them later. My first impression, then, of course was, "It is not so bright as those I have seen before;" my second, "but it is far more extended." I had before me a sheet of drawing-paper with a ¾-inch circle on it to represent the sun, and on this I traced an outline of what I then saw, before the eye had recovered its sensibility. The sun was surrounded by a narrow ring—hardly more than a line—of vivid light, presenting to the naked eye no trace of structure; which faded with great suddenness into a nebulous luminosity that at first appeared to extend to a distance of about two and one-half solar diameters all around. The outline of the faintest part was rudely circular, the brighter light extending farther in the direction of the ecliptic; and I particularly observed the absence of such marked striated structure in this outer part as I had seen at a distance of one diameter in the eclipse of 1869, when the air was decidedly less favorable than now. The nebulosity was not absolutely uniform, for it grew very slowly brighter till close to the sun, when it very suddenly brightened; neither was it absolutely structureless, but it was nearly so (to the naked eye) except in one direction. Making an angle of about 45° with the vertical, were two parallel lines stretching from extremities of a solar diameter (or from rather more) and extending three to three and one-half diameters below and towards the right. The parallelism was to my eye exact, and they were connected by a fainter haze, whose tolerably definite outline was convex towards the sun. Upon the opposite side of the sun, to which I next looked, and in the same direction, the light stretched further into space to the extent of six diameters. . . . I now recurred to the rest of the corona and looked all around the sun without finding any well-marked ray other than those I have noted; but, observing that the light was (as the eye recovered its sensitiveness in the semi-darkness) now traceable much farther in every direction, I drew the second contour. I did not look again to the right of the sun, but turned my attention once more to the great extension on the left, which now presented extraordinary dimensions. Its axial line was almost exactly at an angle of 45° with the vertical, and passed nearly through the center of the sun or slightly below it.

The central part of the wing on the left near the sun was brighter than the edges, which were so diffuse, as to make the determination of its exact boundary difficult. It appeared to me, however, to be considerably more than a solar diameter in width, and it was now visible to fully twelve diameters in length. It was not so absolutely structureless as the zodiacal light, perhaps, and it appeared longer in proportion to its breadth than that; otherwise I should compare it to the zodiacal light with more confidence than to anything else.

I had now much reason to regret having exposed my eye, for it was evident that I was witnessing a real phenomenon heretofore undescribed, and yet that, while the eye was only growing into the proper condition for seeing its real extent, I must turn away. I think I must have gazed at the extension for over one-half the time at my command, looking down upon the white drawing paper to sketch its outline and gazing at it again. It did not momentarily disappear, as a nebula does at night when the sketcher turns his eye from the feebly illumined paper. It remained, I repeat, persistently visible. The twelve diameters through which I traced it under these circumstances, I feel great confidence in saying *were but a portion of its extent.*

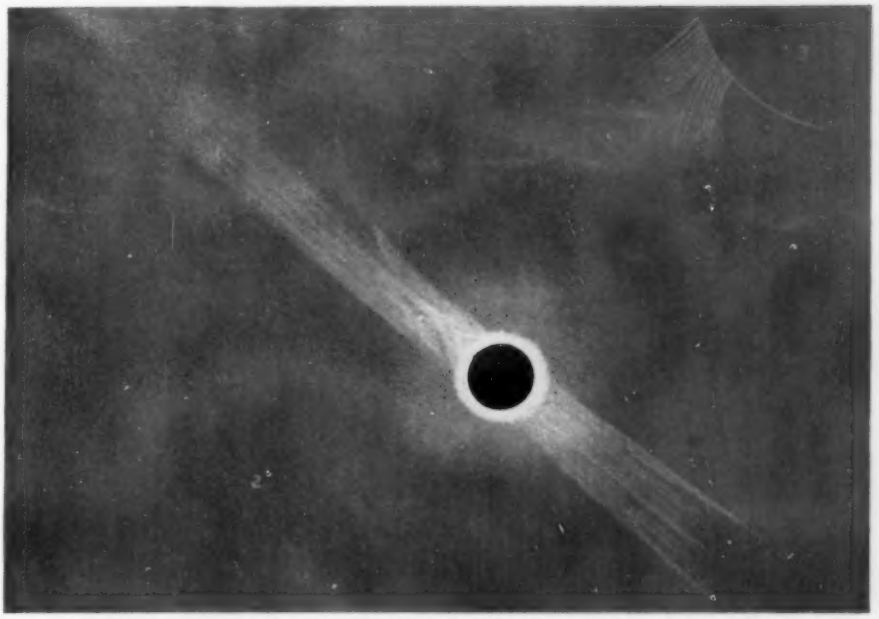
Telescopic View

There were but a few moments left when I turned to the telescope. It happened to be directed toward the northern part of the sun. I adjusted the eye-piece for distinct vision, which appeared excellent, but the view after this lasted, I think, not more than four or five seconds before totality was over. What I saw thus momentarily was not in the least what I expected. If there were any structure in the very inner corona, it had escaped me when I had searched for it in a previous eclipse (at Jeres, in 1870). It is true that the sky was hazy on that occasion, and that on this it was exquisitely clear. Now what I saw in this brief view was a surprisingly definite filamentary structure somewhat coarser and decidedly more sharply defined than I have ever seen filaments in the photosphere, not disposed radially, or only so in the rudest sense, sharpest and much the brightest close to the disc, fading rapidly away into invisibility at a distance of five minutes of arc or more (possibly in some cases of ten). The salient point to me was this very remarkable definiteness and precision of these forms. . .

Immediately after totality my attention was directed by General Myer to the corona, which, as a narrow ring of light about the moon's preceding limb, was at first visible some one or two minutes of arc from the moon, and which, without any other precaution than masking the eye from direct sunlight, remained visible for over four minutes after totality. . . .

Mr. C. S. Shields, who was aiding me at another instrument near the brow of the mountain, found a few seconds of leisure to study the appearance of the light on extended clouds below us, as the shadow advanced. I regret not to have at hand his own words, as his report is not by me while I write; but

their substance was that just before the shadow fell on the clouds, the approach of totality was heralded by a bright yellow light all over them, passing into orange, pink, rose red, and dark red in a few seconds. This was followed by the blue-black shadow. Several others saw this brief but splendid spectacle. The colors were described as being comparable in vividness to those of a bright sunset. It is difficult to say how long it lasted; comparing all the evidence I received, I should say less than ten seconds. An interesting letter is appended from my friend, Mr. E. V. McCandless. He missed seeing the color, having turned at the instant to speak to some one behind him. It will also be noted that his eyes were fatigued by watching a brass instrument intently when he first looked up and saw the corona extending but a little way from the sun and that its extent grew as they recovered in part their sensitiveness. . . .



DRAWING OF 1878 ECLIPSE MADE BY PROF. LANGLEY

From Pike's Peak, 14,400 feet high, the famous student of the sun (who also pioneered in aviation) saw a great extension of the corona which he faithfully recorded.

Report of Mr. E. V. McCandless

I had been assigned the duty of managing the "cat's-eye" of the heliostat. As the time of totality approached, I lay down on the rocks facing the sun, with hand and eyes on the instrument, ready for a signal to open or close. Looking off to the northwest, I could just see the tops of the Snowy Range, distant some 60 to 70 miles. Several bands of white clouds were in view far beyond the range and low on the horizon. Glancing from the instrument, I saw the farthest line of cloud had suddenly become of a deep blue-black hue. A moment later, and each band in succession became the same color, and then the Snowy Range suddenly dropped out of sight.

All my attention was now given to the "cat's eye" for twenty to thirty seconds after "total" had been announced. Finding my services were not required, I looked from the brass "cat's-eye" to the sun. I saw bright rays of light extending apparently to the southeast by east and to the northwest by west. Feeling that my eyes were dazzled by looking at the instrument, I closed and rubbed them for a few moments involuntarily. Again looking at the sun, I saw rays of light much more perfectly, and as I stood looking at them they increased in brightness and length. The rays seemed to be perfectly parallel, those on the western side being a continuation of those on the eastern, but not so long or bright. They appeared to be from two-thirds to three-fourths as wide as the sun; those on the western side appearing to my eyes to be about one and a half diameters of the sun in length, and those on the eastern side being about two and a half diameters in length.

The bounding or outer rays were much the brightest and most steady, the central rays seeming to tremble, or come and go. The impression created on my mind most vividly at the moment was as if next the sun was a great ocean, and the light was being reflected in brilliant parallel bands. There was a very bright, narrow glory of light all around the moon, but the absence of *red* surprised me.

Having finished the rough sketch for you, and about one minute or more of totality having passed, I walked over the extremely rough rocks to the northern edge of the Peak, having ample light; indeed, to test it, I looked at my watch and could see distinctly not only the hour and minute hands but the second hand also. The light was of a yellowish-green color. At the edge of the Peak I looked down on the mountain ranges of the "foot hills", some three thousand to five thousand feet below; Manitou Springs, with its hotels and cottages, some eight thousand feet below, and out on to the great plains stretching for 125 to 150 miles away, with Colorado Springs on the border near the foot hills, at not less than ten thousand feet less altitude than the Peak, and 13 miles away "as the crow flies".

All this was *clearly* seen, but bathed in the most strange yellow light. What struck me at once was that there were *no shadows* to the mountains lying below me, but that all sides were equally light. They looked like "ghosts" of mountains, yet every outline was sharply defined. Turning to the northwest I could distinctly see the sharp outline against the sky of the Snowy Range, with its patches of snow. The bands of clouds were of a much less inky hue than they had at first appeared.

While looking at the clouds far beyond the Snowy Range, the first line sprang into light, and then each band in succession became white and bright. A moment later the mountain peaks suddenly appeared to be climbing up into space and were in brilliant light.

The shadow swept onward, across the South Park, and a moment later "Over" rang sharply over the Peak, and we were in sunlight. Away across the plains swept the shadow, a rounded ball of darkness with an orange-yellow border fading into the light pea-green of the landscape. As it reached the horizon, one hundred and fifty miles away, it lifted into space and was gone, having grown more and more dim as it swept away.

The above classic of science is particularly interesting because the August 31, 1932 eclipse is a repetition of the 1878 eclipse in the sequence of eclipses separated by "saros" periods. A "Langley Memorial Eclipse Expedition" from Science Service will occupy the summit of Mt. Washington, N. H., 6288 feet high, highest point within the path of totality of the August 31 eclipse, which extensively equipped expeditions have avoided on account of unfavorable weather probabilities.

ENGINEERING

Dedicate World's Largest Power Plant in Russia

See Front Cover

DNEPROSTROY was dedicated on August 25.

This hydroelectric power project exceeds similar undertakings in size and difficulty of accomplishment. It is on the Dnieper river in the U. S. S. R.

From an installed capacity of 756,000 horsepower, abundant electricity will be available to smelt iron and other metals and to operate chemical industries. Water is to be pumped to irrigate hundreds of thousands of hectares of rich but drought-affected steppe. Steamers from the Black Sea, 200 miles down the Dnieper, will be able to penetrate hundreds of miles farther inland because the dam, and locks built with it, overcome obstructing rapids.

The cost of the dam, power plant, locks and necessary bridges is approximately 220,000,000 rubles, or $110,000,000. Three and one-half million dollars was spent for construction equipment alone. It is estimated that an additional 620,000,000 rubles will be consumed in developing the industries that will depend on the new source of power. The dam is the largest masonry structure ever built to impound water and was finished six months ahead of schedule.

American Methods Win

This project was a victory for American methods, because both American and European engineers submitted plans and actually tested them before the final contracts were let. The Europeans intended to use the most highly developed automatic construction machinery while the American estimate contemplated employing ordinary steam shovels, concrete mixers and railways built to Soviet standards. Foundation work on the dam was begun on one side of the river by the Europeans working as they preferred and on the other side by the Americans employing their methods. It took only a few months for the Soviet officials to decide in favor of the Americans, Col. Hugh L. Cooper and his organization, and to give them the remainder of the work. The rural Soviet laborers worked more successfully with the simpler American machinery.

Yet, there was a labor problem in the Soviet Union just as there might have been in America. The Soviet government did not make the workers stick to the job. They constantly migrated between farm and industry and often several hundred would leave at one time to go where they had heard they could make more money. Thus the turnover was unusually high, being about sixty per cent. annually. In order to reduce this figure the workers were given houses and comforts superior to those found in most American construction camps. At times as many as 50,000 were employed on the project.

Women Work Overtime

Women worked, too, and were exceptionally efficient. They used surveying instruments and were machine operators, locomotive firemen and concrete placers as well as common laborers. They would often work half an hour after the whistle to perfect a task.

The dam is 3,350 feet long, including the frontage of the power plant, and 140 feet high to the crest of the spillway, above which water will rise as much as 30 feet during floods. This structure impounds a flow varying from 6,300 cubic feet per second during severe droughts to 835,000 cubic feet at times of large freshets. The latter figure represents the greatest flow ever encountered by a structure of this type, and the dam stood this test in 1931 before it was finally completed.

Six of the plant's nine power units, the largest ever built, are now being installed. The turbines, rated at 84,000 horsepower normal capacity and 100,000 horsepower under a maximum head of water, were made in this country. Five of the generators were built in the United States and the remainder are being constructed in the Soviet Union.

While Dneprostroy's normal generating capacity is 756,000 horsepower, it has a maximum or high water capacity of 900,000 horsepower. On account of irregular water flow it will be possible to operate only three of the nine turbo-generating units during the entire year. The world's next largest hydroelectric power plants are Muscle Shoals with a capacity of 610,000 horsepower, 260,000 horsepower of which has already been installed, and Niagara Falls with 430,000 horsepower.

Science News Letter, August 27, 1932

PUBLIC HEALTH

Hope to Vaccinate Farmers in Spotted Fever Area Next Year

ALL FARMERS in the area around the National Capital will be vaccinated against Rocky Mountain spotted fever next spring, if the U. S. Public Health Service is able to carry out its present plans. Every year some two hundred cases of this disease occur in the District of Columbia and adjacent states.

Officers of the U. S. Public Health Service, who have successfully fought the disease in Bitter Root Valley, Montana, where it first appeared, have recently found that a certain variety of tick, which abounds in the neighborhood of the capital, also carries the germ of the disease. Farmers, holiday-seekers and others who get into the bushes and high grass of the surrounding countryside are liable to contract the disease through being bitten by infected ticks.

The infected area contains a population of about four million. It is impossible to vaccinate the entire population of this area, as has been done in the Bitter Root Valley which has a population of only a few thousand. Furthermore, most people in the Washington area never get into the country where they would be exposed to the disease. The U. S. Public Health Service has warned them that if they do go into the country, they should keep away from the bushes, trees and weeds, and watch for the ticks, picking them off as soon as possible. But for the farmers of the area who must be constantly exposed to the danger, the Federal health officers hope to be able to offer immunity through vaccination.

At present the supply of vaccine against Rocky Mountain spotted fever is small. It is both expensive and dangerous to make. No commercial firm will handle it. Several of the Federal health workers lost their lives in producing the vaccine at the Montana laboratory. The vaccine gives immunity to the disease for about one year, and would be given in the spring in the Washington area, as that is the beginning of the season when the infected ticks appear. The end of this season's outbreak in the East is expected within the next two weeks, as at that time the cooler weather will have killed off most of the ticks.

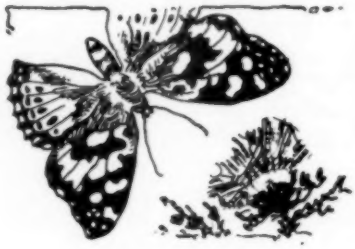
Rocky Mountain spotted fever has been prevalent in the Washington area since 1909, health officials believe, although it was not recognized as such until recently.

Science News Letter, August 27, 1932

Among the fruits from which the ancient Romans got their vitamins were apples, pears, plums, grapes, peaches, apricots, and cherries.

ENTOMOLOGY

NATURE RAMBLINGS by Frank Thone



Thistle Butterfly

WHO TOLD the thistle butterfly that its light browns and subdued yellows set it off so advantageously against the electric blues and light purples of its favorite flower? No lady of fashion could more skilfully set her gown against her background.

Popular nomenclature was at one time not kind to this bright insect. A widely used name for her is "painted lady"—once a designation of not-quite-nice connotation, but now, since practically all ladies are painted, largely deprived of its sting. Scientists call her, most euphoniously, *Vanessa cardui*. The last, or specific, name refers to her favorite food plant, the thistle, whose botanical name is *Carduus*.

The thistle butterfly is devoted to the thistle not only when she is a grown insect with wings to travel on and good eyes for choosing between flowers. At an even more important time, during her caterpillar infancy, she depends on the thistle exclusively. Hatching from her egg on the surface of a thistle leaf, she crawls underneath and spins a little tent for herself. After feeding until she has outgrown it, she returns to the top of the leaf and spins a larger dwelling, and finally a third and further augmented one. All the time she battens on the leaf tissue. Philosophizing naturalists, who like to point out the preference of asses for thistle leaves, might well take note of the competing taste of these smaller animals.

It is the common belief among entomologists that the thistle butterfly hibernates as a grown butterfly, at least in the United States, but its winter hiding place has never been discovered.

Science News Letter, August 27, 1932

EUGENICS

Eugenicists Urged to Drop Cattle Breeding Analogy

EUGENICISTS ought to stop comparing their program for improving the human race with the cattle breeder's program for improving his cows. It only gets them public misunderstanding and hostility, warned Robert Cook, editor of the *Journal of Heredity*, in an address before the Third International Congress of Eugenics.

"If eugenic reform is really to make progress, must we not show how eugenic ideas and ideals fit into the picture of everyday affairs?" Mr. Cook asked his audience. "This must be done in a way that does not offend the prejudices and notions of intelligent people.

"An example of what is meant is the linking of eugenics with stockbreeding, which is sometimes rather naively done by professed eugenicists. Is this analogy either accurate or good policy? The underlying laws are, it is true, the same, but the stock breeder's technique, intended to produce a uniform type, suitable for a definite and circumscribed purpose, is not and cannot be the technique of the eugenicist, who deals with 'forces under social control.' An ideal of a uniform 'superior type' is not at present either racially or socially desirable.

"When we consider, furthermore, the violent emotional reactions which the stockbreeding analogy is likely to evoke its value in eugenic enlightenment is seen to be very problematical."

Science News Letter, August 27, 1932

PHYSICS

Oxygen Disintegrated With Neutron Projectiles

OXYGEN has been artificially disintegrated by bombardment with neutrons in experiments at the famous Cavendish laboratory at Cambridge.

Oxygen is the common gas of the air that all of us breathe and neutrons are the new fundamental particles of matter, close combinations of proton and electron, that were recently discovered.

The disintegration is announced in a communication to *Nature* by Dr. N. Feather of Cambridge.

Photographs were obtained of the recoil and paired tracks of the results of the disintegration produced in an oxygen-filled expansion chamber. Polonium and beryllium at the center of the chamber provided the neutrons which hit and smashed the oxygen atoms.

The capture of the incident neutron seems likely in all observations made by Dr. Feather and he concludes that the disintegration particle is almost certainly an alpha particle or the heart of a helium atom.

The results show an absorption of energy and confirm Mme. Curie's recent suggestion that a small fraction of the beryllium radiation has a higher energy than the previous upper limit.

Although Lord Rutherford in 1919 and succeeding years performed the first artificial disintegrations of a number of elements, notably nitrogen, by bombardment with alpha rays, he did not break down oxygen. His colleague has now done so, using neutrons.

Science News Letter, August 27, 1932

CHEMISTRY

Smaller Loaves and Cakes From Rust-Diseased Wheat

WHEAT ATTACKED by the leaf-rust fungus yields soft grain that mills into flour which in turn yields smaller loaves and cakes per unit of weight than those obtainable from undiseased grain. That is, in condensed summary, the result of investigations by Prof. H. R. Kraybill and associates of Purdue University, as reported to the American Chemical Society. Prof. Kraybill also stated that wheat from rusted grain had less protein and more starch than healthy wheat; it yielded flour slightly lower in protein and bran, and middling much lower in protein.

Science News Letter, August 27, 1932

First Glances at New Books

National Parks

RESEARCH AND EDUCATION IN THE NATIONAL PARKS—Harold C. Bryant and Wallace W. Atwood, Jr.—*Govt. Print. Off.*, 66 p., free. The U. S. National Park Service conceives its duty to the public as something more than the mere custodianship of pleasure-grounds. It sees the national parks as a people's university, and during recent years has been actively developing a comprehensive educational scheme, comprising elements that range all the way from lectures and nature trails for tourists who are perhaps having their first contact with the wild, to facilitating the researches of noted veterans of research. This booklet tells of the work.

Science News Letter, August 27, 1932

Zoology

THE COLLECTION AND PRESERVATION OF ANIMAL FORMS—M. M. Wells—*Genl. Biol. Supply House*, 72 p., $1. This manual contains information difficult to obtain elsewhere, that will enable any teacher or student to become his own collector and curator. It gives instructions for the preservation of everything from protozoa to mammals, and concludes with a section describing fully the various preserving agents used in biological work.

Science News Letter, August 27, 1932

Dental Hygiene

YOUR TEETH AND THEIR CARE—Carl W. Adams—*Mosby*, 141 p., $1.28. This concise and clear explanation of the structure and function of the teeth, their diseases and deformities, dental treatments and the relation of the dentist to the public should be interesting and helpful to all lay readers.

Science News Letter, August 27, 1932

Gelogy

AN INTRODUCTION TO GEOLOGY—William Berryman Scott—*Macmillan*, vol. I, 604 p., $3.50; vol. II, 483 p., $3. The third edition of a successful textbook, written by one of the best known of American geologists.

Science News Letter, August 27, 1932

Ethnology-Agriculture

TOBACCO AMONG THE KARUK INDIANS OF CALIFORNIA—John P. Harrington—*Govt. Print. Off.*, 284 p., 36 pl., 80c. The Karuk Indians of northern California were most unusual in that they cultivated just one crop, tobacco. Mr. Harrington has collected data regarding the growing of tobacco, its uses in ceremony, medicine, and other connections, and the expressions and proverbs that dealt with tobacco. Emphasizing the Indian language, Mr. Harrington parallels Indian text with English text through the greater part of this monograph.

Science News Letter, August 27, 1932

History of Science

FIFTY YEARS RETROSPECT—Royal Society of Canada—*Royal Society of Canada, Ottawa*, 179 p., limited ed., sales ed. to be published later. This anniversary volume, 1882-1932, commemorates the fifty years of activity of the academy of Canadian science. Composed of authoritative and readable summaries of Canadian science for the last half century written by today's leaders, this book is an important contribution to the history of science on the American continent. The present high level of Canadian science is seen as a substantial growth well grounded in the past when viewed through this collection of historical essays.

Science News Letter, August 27, 1932

Chemistry

AN INTRODUCTION TO CHEMISTRY—John Arrend Timm—*McGraw-Hill*, 553 p., $3.50. Called a pandemic text in its subtitle, this college chemistry is now in its second edition. Its footnote references to more current important chemical literature are refreshing.

Science News Letter, August 27, 1932

Protozoology

THE FORAMINIFERA OF THE TROPICAL PACIFIC COLLECTIONS OF THE "ALBATROSS," 1899-1900—J. A. Cushman—*Govt. Print. Off.*, 88 p., 17 pl., 20c. The present publication comprises Part I: Astrorhizidae to Trochamminidae.

Science News Letter, August 27, 1932

Archaeology

PRELIMINARY REPORT UPON THE EXCAVATIONS AT TEL UMAR, IRAQ—Leroy Waterman and others—*Univ. of Michigan Press*, 62 p., 13 pl., $1.50. Excavations have led to the conclusion that this was probably the much-disputed site of Opis. Mr. Waterman explains the reasons for this identification. Architectural features are described in two papers by N. Mannasseh and S. Yeivin. Fragments of clay stamped with Greek legends and a large number of coins are discussed by R. H. McDowell.

Science News Letter, August 27, 1932

Astronomy

ECLIPSES OF THE SUN—S. A. Mitchell—*Columbia University Press*, 490 p., $5. This third edition, revised and enlarged, of the most comprehensive volume on solar eclipses appears in time for the eclipse of August 31. It incorporates the results of the eclipses of 1925, 1926, 1927, 1929 and 1930 and analyses the latest theories about eclipse phenomena. The author, director of the Leander McCormick Observatory of the University of Virginia, is now preparing to observe his ninth solar eclipse.

Science News Letter, August 27, 1932

History-Geography

FROM HUNTERS TO HERDSMEN—Elizabeth Forbes O'Hara—*Macmillan*, 67 p., 60c. In simple story form, for third grade children, this little book describes the important economic change that took place when men found out that they need not depend on wild beasts for meat. The type is large, the pictures attractive. At the end of each story chapter are suggested activities for the class, such as clay modeling, making butter, or arranging a sand table.

Science News Letter, August 27, 1932

History-Geography

TAMING THE WILD GRASSES—Elizabeth Forbes O'Hara—*Macmillan*, 69 p., 60c. Of the same type as the foregoing publication. In these stories about the dawn of farming, the characters are fictional, but the author has kept very close to the facts, as present-day science understands them.

Science News Letter, August 27, 1932

Entomology

THE FORMS OF THE COMMON OLD WORLD SWALLOWTAIL BUTTERFLY (PAPILIO MACHAON) IN NORTH AMERICA, WITH DESCRIPTIONS OF TWO NEW SUBSPECIES—Austin H. Clark—*Govt. Print. Off.*, 15 p., 8 pl., free. Full descriptions of the forms of one of our most familiar butterflies.

Science News Letter, August 27, 1932

Physiology

THE WISDOM OF THE BODY—Walter B. Cannon—*Norton*, 312 p., $3.50. Dr. Cannon's latest book discusses his theories and studies of how the body takes care of itself automatically. Scientists will welcome the book and the careful lay reader will find much to interest him.

Science News Letter, August 27, 1932